



COLLIDER-ACCELERATOR DEPARTMENT

Title: EMS Training For Magnet Cleaning Operations

Prepared by: M. Van Essendelft

Group: ESH&Q

Approvals

Signature on File Date: _____

ESH&Q Division Head

Signature on File Date: _____

Collider-Accelerator Department Chairman

(Indicate additional signatures)

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☐ x FS Representative: _____ Date: _____

☐ x Radiological Control Coordinator: _____ Date: _____

☐ x Chief ME: _____ Date: _____

☐ x Chief EE: _____ Date: _____

☐ x Environmental/P2 Coordinator: _____ Date: _____

☐ x QA Manager: _____ Date: _____

x ☐ Other: _____ *Signature on File* Date: _____

Environmental Training Package for Magnet Cleaning Operations

This package has been designed to aid in the delivery of required job-specific training for the following in-place magnet cleaning activities in buildings 912, 913 and 927 identified in the environmental process evaluation

- Flushing with nitrogen/water
- Flushing with acid solution
- Liquid discharges
- Radioactive waste generation

Your position has been determined to have significant potential to impact the environment. Thus, C-A Department Management has prepared the questions & answers on the following pages for your specific work/processes.

This environmental material is incorporated into your current job and procedure training. If you have specific questions about this information after you have read the material, contact the C-A Department ESH&Q Division Head, Ray Karol (<mailto:rck@bnl.gov>).

You may keep this material as a handout and use it as a reference aid.

This specific training course is linked to your job-training assessment (JTA). You must read and acknowledge this material as part of the qualification to perform magnet cleaning operations. Please fill out the Read and Acknowledgement form and return it promptly.

[Read & Acknowledgement Form](#)

Environmental Process Evaluation Title: Magnet Cleaning Operations

Environmental Aspects: Atmospheric Discharge, Radioactive Waste, Liquid Discharge

Contacts for Further ESHQ Information:

Associate Chair for ESHQ, E. Lessard
Head of ESHQ Division, R. Karol
Environmental Coordinator, J. Scott
Environmental Compliance Representative, M. VanEssendelft
ESH Coordinator A. Etkin
Radiological Control Division Representative, P. Bergh
Procedures Coordinator, L. DiFillipo
Quality and Assessment Manager, D. Passarello
Self Evaluation Program, A. Piper
Source Custodian, P. Cirnigliaro
Tier 1 Coordinator, A. Piper
Training Manager, J. Maraviglia
Training Records, A. Luhrs

Course Objective: Because your work activities have been identified as having significant potential to impact the environment, this course has been designed to provide you with the job-specific information that you must know to protect the environment.

1) What potential impacts to the environment are associated with your activities?

- Backwashing magnets with magnet cooling water is the preferred method to clean magnet cooling water passages. If this is unsuccessful, flushing with a nitrogen/water mixture or, if also unsuccessful, flushing with an acid solution is performed. These operations can release radioactive materials or hazardous chemicals. The following materials in your work may have adverse impacts if improperly handled:
 - Magnet cooling water may be radioactive or hazardous or both
 - Flush water may be radioactive or hazardous or both
 - Bag filters used to filter radioactive acid waste are radioactive and may be hazardous
 - Chemicals such as Safe Acid Powder H-400 (used for the acid flush) and sodium bicarbonate (used to neutralize the used acid) may be hazardous

2) What consequences may result if your operations were to impact the environment?

- Hazardous, industrial or radioactive waste mismanagement could contaminate the environment and incur RCRA or local agency penalties
- Improper discharges to the sanitary sewer system could result in a violation of the BNL State Pollutant Discharge Elimination System (SPDES) permit
- Atmospheric discharges could contaminate the environment and/or violate NYSDEC air emission regulations
- Improper release of radioactive materials to uncontrolled areas may result in enforcement actions under Federal Rule 10CFR835
- Improper release of wastes can create loss of regulator and public trust

3) What benefits or positive effects would you notice with improved environmental performance?

- Safer, cleaner workplace
- Clear roles and responsibilities
- Improved relationship with regulators and the public
- Control of disposal costs
- Prevention of remediation costs
- Reduced emissions

4) What role and responsibility do you have for these potential impacts and environmental performance?

My responsibilities are

- To ensure Hazardous, Radioactive and Industrial wastes are handled according to C-A procedures
- To ensure controls are in place
- To ensure controls keep working
- To take action when controls fail
- To create and keep appropriate records relative to operational controls
- To contact supervision if unsure of how to perform the work or if the procedures are unclear or incorrect

5) What controls or procedures are implemented to reduce the potential for emergency?

- [C-A OPM 8.20](#), Procedure for Handling and Disposing of Hazardous Waste
- [C-A OPM 8.20.2](#), Radioactive Waste Disposal
- [C-A OPM 8.22](#), Procedure for Handling and Disposal of Non-Hazardous and Recyclable Solid Waste
- [C-A OPM 8.20.1](#), C-A Hazardous Waste Trailer (HWT) (90 Day Accumulation Area)
- [C-A OPM 2.28](#), Enhanced Work Planning (C-A version of ES&H Std. 1.3.6)
- Satellite Accumulation Area
- Chemical Management System
- Tier I program and self-evaluations

6) How would you respond in an emergency to reduce the potential for environmental impact and what actions could be taken to mitigate the event?

- See [C-A OPM 3.0](#), Local Emergency Plan for the C-A Department
- Call Spill Response Hotline – X2222 or 911 (If calling from a cell phone, dial (631) 344-2222)

7) What pollution prevention and waste minimization techniques have been or could be considered to reduce or eliminate the potential to impact the environment?

- If you place flush water or acid drums in secondary containment during the flushing operation
- If you ensure that all fittings and connections are properly made and are promptly verified to be leak-tight when cleaning magnets and when restoring magnet cooling water connections to normal configuration
- Installation of filters in the magnet cooling water system downstream of the black iron pipes prior to the magnets. The black iron pipes generate particulates that can plug the magnet cooling passages.
- Installation of a deionization system in the cooling water system.

Suggestions or comments about pollution prevention or waste minimization are always welcome by C-A management.

8) Are there any key Environmental-specific Competency Requirements for this position?

- None

Additional Environmental Information:

Click on the items below to learn more about C-A Magnet Cleaning Operations.

- [Process Assessment](#) for C-A Magnet Cleaning Operations
- [Environmental Management Program](#) for C-A Magnet Cleaning Operations
- [Operational Control Form](#) for C-A Magnet Cleaning Operations